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ABSTRACT

Behavioral technology applied to language instruction at the college level is contrasted with instructional approaches based on an educational philosophy of a more theoretical nature. While focusing on individual needs and the possibility of self-instruction, the author discusses conventional laboratory teaching, task performance theory, systems, terminal behavior, "mands", psycholinguistics, and laboratory equipment. Language instruction objectives and procedures to redirect language laboratory use are described. (RL)

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APPLICATIONS OF BEHAVIORAL TECHNOLOGY: FROM CONVENTIONAL LAB TEACHING TO TECHNOLOGICAL TOTAL SELF-INSTRUCTION

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APPLICATIONS OF BEHAVIORAL TECHNOLOGY: FROM CONVENTIONAL LAB TEACHING TO TECHNOLOGICAL TOTAL SELF-INSTRUCTION

by

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From phonograph to tape recorder, from tape recorder to remote audio video dial-access, and then to the touch-button random access Audio-video lab, the magic of electronics is rapidly providing more advanced machinery for the teaching of languages. As a matter of fact, electronics is moving so fast that what was new today is old tomorrow. Thus, at present one may find in different schools and colleges a myriad of electronic equipment which may vary from the formal audio language lab setting, to remote random-access audio-video machines able to provide hundreds of programs at the touch of the finger.

The growth of the lab with its different modifications has been dictated by different theories behind language learning and teaching. [1] The purpose of the lab and its functions, although seen differently in many different language departments, is still viewed by many as simply to be used as a broadcast or library facility. In effect the lab is seen as an extension of the classroom and is still teacher-centered. On the other hand, the new concept of the new machines is student-centered, moving more towards providing a great deal of flexibility, meeting individual differences, independent study, and self-instruction. Thus, it is moving more into different controls such as "self-pacing", "self-evaluating devices", "step increment", and even appropriate "reinforcement". In many ways the new machines are not very different from the old lab since the new machine tries to solve the very problem which brought about the origin and development of the lab, namely; the problem of quality instruction and the individual in the age of mass education.

From the very beginning the lab has not been used properly in most places, thus its effectiveness has been impaired. [2] It is sad that many departments are acquiring highly sophisticated electronic machinery, yet they have not even reached the basic rules for more effective language lab teaching stated by Dr. Gaarder and Dr. Hutchinson some time ago. [3] Worse yet, they are not familiar with the concepts of technological instruction, thus the equipment is wasted.

Today language departments have to face the fact that a language laboratory, whether it is used as a broadcasting system, as a library system, or as a partial or total self-instruction medium it is a teaching machine. Professor Rand Morton, already indicated this role of the language lab in his work The Language Laboratory as a Teaching Machine (1959). [4] Most probably due to their training in the humanistic aspect of a language and because of the lack of background in the behavioral aspect, language departments have not understood from the very beginning the potentialities or functions of the language lab. Thus, while on one side advanced thinkers and the science of electronics provide the most highly developed equipment, the average language department has made little change in the materials, faculty, organization, curriculum or even use of the machine to meet the new demands and challenges. The impact or the efficiency of labs has been almost negligible due to the fact that many colleges and schools have just married new machines to old concepts. Actually this has not worked very well. In order to use their equipment efficiently the language departments must reach the conclusion that they are dealing with teaching machines and therefore have to borrow concepts from technological instruction.

Technological instruction is the outcome of behavioral technology, which in turn, is the outcome of a specific relation between learning theory and communication applied to instruction. The major difference between learning

theory, communication theory, and behavioral technology is that, while the former are mostly theoretical , the latter is mostly empirical, and more interested in how and what behavior is modified rather than the why's and when's which may effect it. Briefly, technological instruction can be explained as "...the application of behavioral technology to the systematic production of specified behaviors for instructional purposes." [5] Thus, the concern of technological instruction is not so much with the machines or the use of the machines but rather in the applications of learning theories to instruction in order to find out by experimentation, testing and evaluation, how and what behavior of the learner is modified. For these reasons, technological instruction also involves the control components of communication between machine systems, from task performance to goal seeking procedures and behavioral-shaping techniques. As in any communication system, it also involves many technical components as well as many other technical phases and aspects which require study and systematic formulation.

Technological instruction embraces all the elements of task performance, from the environmental and behavioral phases to the variables of frequency, latency, and accuracy. It includes measurements of behavior and their interpretation; audio-visual instructional and technical problems of the communication media. It involves principles of programmed instruction with its empirically determined adaptive sequence of sized steps, immediate reinforcement, self-pacing, continuous evaluation of procedures, and continuous control of learning activities. The outcome of technological instruction is a "system" which involves subject matter and the media, with the procedures all coordinated and designed to produce specific behavioral goals. [6] This "system" is involved with the instructional interaction between learner and media. It seeks the shaping of behavior, methods, and procedures, giving data for evaluation and continuous improvement.

Some work done in language using programmed instruction materials and language labs comes very close to what is meant by technological instruction. To apply successfully the concepts of behavioral technology for technological instruction, language departments have to change the materials they use as well as the organization of the departments. First they have to set objectives of the courses based on performance rather than credit. That is the objectives have to be behavioral. These objectives cannot be vague like "developing listening-speaking skills." As in programmed instruction the skills to be achieved by the student have to be behaviorally detailed, and the measurements have to be behaviorally detailed too. The materials used have to have the mechanics of sequence of sized steps, immediate reinforcement, and so on, plus the content which would guide the learner towards the "terminal behavior," of the course. The machine and the materials, must of course, have the potential to produce the behavior that one tries to shape.

Most materials in the market today are not appropriate for this type of teaching, even the materials in programmed instruction fall short of the normal objectives for schools or colleges. On the other hand, the problem of most materials, whether programmed instruction or conventional is that they are still based on language learning assumptions of applied linguistics. For instance, the teaching of sounds first, and forcing the student to memorize pattern drills and dialogues by different devices with the assumption that this will lead to fluency in different situations has not proven very successful because this does not have anything to do with language learning which involves decision making, selection and manipulation of verbal units according to different stimuli. Most programmed materials used in language learning have not been very successful because they have departed from the same assumptions, furthermore the mechanics and controls used are very unrelated to the learning of a language, for instance asking a student to choose from several answers the one which is the correct

response to a question. Incidentally, some linguists have criticized Skinner's description of verbal behavior [7] especially in relation to programming, without realizing that most of the responses in the programs are far removed from what Skinner says. For instance, the teaching of the "mands." The programs usually develop what they think are "mands" by asking the student "ask for a pencil in French". In return the student will produce the mand "Donnez-moi le crayon." However, this is not a "mand", but an intraverbal response since the reinforcing factors for the "mand" are missing. [8] When you ask for a pencil in French you usually get a pencil or some other response in relation to the pencil. This is the reinforcement for this "mand."

While applied linguistics can provide a great deal of the content of "what" should be learned, the psychological aspect of language learning and teaching should be based on the findings of psycholinguistics and an application of these findings to technological instruction. Some of us have tried it already with a great deal of success. With this type of material and appropriate machines total technological self-instruction is possible. We have moved from the area of experimentation in this field to the area of application as a normal procedure in a language department. [9] Of course, for this purpose the organization of the department has to change also. The way that the Department of Languages and Linguistics at Florida Atlantic University was organized may serve as a practical example. Of course, this is not intended to be a rigid blueprint but rather a general guideline, which may change according to the different needs and situations.

The first step was to set up the courses in a type of taxonomy of educational objectives, with each course having its own terminal behavior. The definition of the terminal behavior was very important in order to set the "systems", the evaluations, and tests. The beginning two years in a language formed a level.

The courses in advanced conversation and composition formed another level. Culture, Civilization and Literature were another, and the courses in Linguistics were also divided into levels. Each individual course, as well as the level, had a detailed terminal behavior complying with the objectives set by the taxonomy. Some levels were pre-requisites to the next level (for instance, level 1, Basic Skills, was a pre-requisite for level 2, Conversation and Composition). Different levels led to the completion of a major. Those majoring in linguistics were required to reach the terminal behavior for levels 1 and 2, and then show some proficiency in the Culture, Civilization, and Literature level. The reverse process applied to those majoring in Literature, who had to show specific behavioral accomplishments in the first level of linguistics.

The setting of the behavioral objectives was very important in guiding the department in the behavioral changes which were being sought in the students. The levels acted as incremental steps to larger units, and the courses as incremental steps to the levels. The level was not only an objective behavioral stage of accomplishment, but was also being used as evaluation for branching or placing transfer students.

The basic teaching and testing of the department in the levels 1 and 2, was centered around the audio-video dial-access laboratory. Tests were given at normal exam periods of the university, however, students could take the test any time they were ready. The basic skills level was completely self-instructional. Most of the "systems" and tests used were developed by the department. The organization profile of the faculty was geared towards technological instruction. There are always, in a faculty, people with varying degrees of interest, some who are interested in doing research in their field, others who are interested in teaching, still others who are interested in research in teaching. The purpose of the department was to make the best use of all talents. Thus, the department had "systems" project directors, research directors, a testing director,

programmers, lecturers and so on. Some graduate and undergraduate students participated in the department projects and to many of them goes a great deal of credit for what was accomplished.

Someone may say that the overall look of the organization is not very different from the conventional, however, notice briefly a few examples of what was accomplished. First we knew exactly what a student who had reached the terminal behavior for a Basic Skills course for example, had accomplished. This is different from a student taking the same course and receiving a B at the final exam. Two instructors do not teach the same type of course, nor does a B grade mean the same thing to two instructors. Furthermore, the student could study and work at his own time and spend more or less time according to his aptitudes.

The problem of mass education is that of overcrowded classrooms and lack of interest in the individual. There are today universities whose classes in Basic Skills have about thirty students or even forty. How can a spoken language be taught to so many students? With the organization set up at Florida Atlantic University the student received individual attention. First the ratio had changed in his favor, instead of being one of thirty students with one instructor, he had a "system" developed by the best that several experienced instructors could offer him. Then because of the number of instructors saved by the machine (with technological instruction there is no need to divide the Basic Skills into sections) the courses in the upper levels were smaller, a ratio of ten students per instructor.

Student reaction to technological total self-instruction may vary according to programs, conditions and so forth. Students at Florida Atlantic University were in general enthusiastic. [10] If one agrees with Skinner that the failure of a student in a programmed course is not the fault of the student but of the materials and medium, he is in a better position to understand certain problems. Also one must understand that students who may be accustomed to educational

spoon-feeding and teacher-centered controls cannot adapt immediately to total self-instruction. For these problems two suggestions may be worthwhile: constant evaluation and development of better programs or "systems", and giving the student specific time limits when to finish the course. At the beginning at Florida Atlantic University about 40% of students did not complete the work, this percentage was of course lowered in time.

There is a new educational revolution taking place, the first modern educational revolution was mass education, the new educational revolution is to make the individual the measure of all teaching. This blueprint just sketched is part of this revolution and one of the ways to use to its fullest the sophisticated electronic equipment that language departments have at their disposal to meet the different problems of mass education. Perhaps it is not the best yet, but it is an indication that a lot of things have to change in the departments. Language departments and teacher training are still dominated by the humanistic aspects of language. It is much accepted today that the learning of a language is a psychological skill, yet old humanistic or linguistic beliefs still dominate its teaching. Thus, even when the machines are used in what some people may call an effective way which briefly means a close integration of machine and classroom work, still they are not used to their fullest potential. To meet the new needs of the new revolution the language department will have to change from these conventional lab concepts to technological self-instruction concepts. This means other changes too, in administration, faculty, curriculum, teacher training and in providing centers for the development of self-instructional materials.

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